Enbridge Northern Gateway Project
Joint Review Panel

Letter of Comment

Contact information and written comments will be placed on the public registry for this project.

Hard copy filings may be made by mail, courier, hand delivery or fax at the address below.
Joint Review Panel - Enbridge Northern Gateway Project
444 Seventh Avenue S.W., 2nd floor mailroom
Calgary, Alberta T2P 0X8
Facsimile: (403) 292-5503, or toll free at 1-877-288-8803

Date: **31/08/2012**

Contact Information

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Please ensure that your letter of comment includes:

- the nature of your interest in the proposed project
- comments on the proposed project
- any relevant information that will explain or support your comments

Comments

Attach additional pages if necessary.

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August 31, 2012

Secretary to the Joint Review Panel
Enbridge Northern Gateway Project
444 Seventh Avenue S.W.
Calgary, AB T2P 0X8

Re: Letter of Comment Submission

Dear Joint Review Panel,

This letter of comment addresses the fate of oil spilled within the confines of Hecate Strait. In particular, we consider where the oil released from a tanker accident in this region is likely to end up. We are concerned that there is a high likelihood that a spill will occur, and about the potential consequences for the local ecosystem and nearby human communities and economies.

Hecate Strait is considered the "fourth most dangerous body of water in the world" by Environment Canada [1]. Enbridge, Inc. proposes that 220 oil tankers will be making their way along the coast of British Columbia each year if the Northern Gateway Pipeline Project goes though [2]. This alone means an 84% increase in tanker traffic to port [3]. The largest tankers incorporated in marine traffic by Enbridge's fleet would be VLCCs, which hold over 2 million barrels of oil [2] - eight times the amount that spilled from the Exxon Valdez in 1989 (257,000 barrels of oil). Within a decade (1999-2009) there have been 1,275 marine vessel incidents along the coast of British Columbia, including five major incidents along the proposed tanker route involving large vessels [4]. One of these was the Queen of the North that sank and killed two people. In 2009 the Petersfield, a bulk carrier, hit land in Douglas Channel after its navigation equipment failed. The area was thought to be deep enough for the tankers to pass, but the margin for error is slim. This is especially concerning given that part of the Enbridge tanker route is only 35m deep, barely clearing the 33m minimum required for a tanker to safely pass through. Using Enbridge's data, it has been calculated that the risk of a Northern Gateway tanker crashing at sea in the next 50 years is 18.1%. The chance of a spill of up to ten thousand liters at the Kitimat terminal is 47.8%, and a spill of more than one million liters is 15.6 percent [5]. Were a spill to occur, the rough waters of Hecate Strait could delay emergency response teams for up to 72 hours [6].

We conducted a series of experiments to determine the pathways that inert particles released within Hecate Strait are likely to follow. The particle trajectories are driven by the surface velocity fields of the global high-resolution ocean model known as OFES [7]. OFES is configured on a 1/10 degree horizontal resolution grid with 54 vertical levels. It is initialized with World Ocean Atlas temperature and salinity fields, and forced with observationally constrained surface wind and buoyancy fluxes. Figures 1 and 2 from our study can be viewed here:
https://www.dropbox.com/s/vx74uhu5b37dbmk/Enbridge%20submission%20Figures%201%20and%202.docx

Figure 1 shows the time-mean ocean surface produced by OFES in the region of interest. As one may expect, the currents in the Northeast Pacific are quite strong (exceeding 10 cm/s) and directed towards the British Columbia coastline; a direct result of the dominant large-scale westerly winds. We note that the OFES simulation has been widely used to study the North Pacific region and is found to be good agreement with observational data [8].

Figure 2 shows the trajectories of 3165 particles that are released in the middle of Hecate Strait (black dot in Fig. 2 denotes the release point: 131W, 53N). The circles with the black edges denote where particles eventually reach coastal land. In particular, we find that in less than one year all of the particles beach themselves along the British Columbia coastline shown in Figure 2, while none of the particles escape to the open ocean. The colors in Figure 2 denote the month in which the particles are released. A winter release leads to beaching in the southern portion of the Strait, while a summer release would tend to lead to beaching in the northern portion of the Strait (a direct result of seasonal wind shifts). A movie of the particle movements in time (using the same color scale as Figure 2) can be viewed at http://dl.dropbox.com/u/8236298/BCoilspill.mov.

We note three important caveats to these results. Firstly, OFES does not completely resolve the fine scale topography of Hecate Strait and the nearby islands and inlets. Secondly, the OFES model does not include tidal forcing, which can

influence the currents in the region. Thirdly, the particles released are inert. However, these caveats have been addressed by the high resolution regional oil spill ocean simulations commissioned by www.livingoceans.org (see: http://www.livingoceans.org/initiatives/tankers/oil-spill-model). Indeed, the same results are found in both simulations: particles released in Hecate Strait are bound for the nearby British Columbia coastline without exception.

Because there is a reasonable likelihood of a large oil spill in Hecate Strait, and that spilled oil is bound for the coastline, we ask the Joint Review Panel to carefully consider other submissions that deal with the potential impacts to: 1) coastal ecosystems, including Pacific salmon, Pacific herring and other shore spawning forage fish, kelp forests, sea otters (SARA listed), and marine birds and mammals; 2) regional resource and tourism economies that are dependent on a healthy coastal environment; and 3) First Nation peoples whose traditional rights and title will be violated.

Sincerely,
J. Paul Spence
Erik van Sebille
Morgan D. Hocking

Figure captions:

Figure 1: Time-mean surface currents in the Northeast Pacific as simulated by the OFES global ocean model.

Figure 2: Trajectories of 3165 particles that are released in the middle of the Hecate Straight (the black dot denotes the release point). The black edged denote where particles eventually reach coastal land. The colors in denote the month in which the particles are released. In less than 1 year all of the particles beach themselves on along the British Columbia; none of the particles escape to the open ocean.

References:
[1] Environment Canada – Marine Weather Hazards Manual
[2] Enbridge, Inc. Northern Gateway Project Application, Volume 8A: Overview and General Information—Marine Transportation
[3] Enbridge Northern Gateway Pipelines. B23-3 TERMPOL Surveys and Studies. Section 3.2: Origin, Destination and Marine Traffic Volume Survey, pp. 107, 163. 2010.
[4] Living Oceans. Marine Vessel Incidents in Canada's Pacific Waters. livingoceans.org/maps/tankers/marine-vessel-incidents-canadas-pacific-waters
[5] Hume, Stephen, 2012. Citizen Marsh Calculates the Odds of a Northern Gateway Oil Spill. The Vancouver Sun. Retrieved August 24, 2012 from <<http://www.pacificwild.org/site/press/1342402874.html>>
[6] Luk, V., 2012. Northern Gateway pipeline: Oil spill response plans can't eliminate human error. Retrieved August 24, 2012, from <<http://www.thestar.com/news/canada/article/1239072--northern-gateway-pipeline-oil-spill-response-plans-can-t-eliminate-human-error>>
[7] Masumoto, Y., et al. (2004), A fifty-year eddy-resolving simulation of the world ocean—Preliminary outcomes of OFES (OGCM for the Earth Simulator), J. Earth Simul., 1, 35–56.
[8] Sasaki, H., M. Nonaka, Y. Masumoto, Y. Sasai, H. Uehara, and H. Sakuma (2008), An eddy-resolving hindcast simulation of the quasiglobal ocean from 1950 to 2003 on the Earth Simulator, in High Resolution Numerical Modelling of the Atmosphere and Ocean, edited by K. Hamilton and W. Ohfuchi, pp. 157–185, Springer, New York.